

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1. (Withdrawn) A recombinant polypeptide comprising a delta-9 desaturase enzyme from a prokaryote in operable linkage with an endoplasmic reticulum retention and retrieval signal sequence.

2. (Withdrawn) The recombinant polypeptide of claim 1, wherein said prokaryote is a bacterium.

3. (Withdrawn) The recombinant polypeptide of claim 1, wherein said prokaryote is a cyanobacteria blue-green alga belonging to a genus selected from the group consisting of *Anacystis*, *Synechocystis*, and *Anabaena*.

4. (Withdrawn) The recombinant polypeptide of claim 3, wherein said cyanobacteria is *Anacystis nidulans*.

5. (Withdrawn) The recombinant polypeptide of claim 1, wherein said delta-9 desaturase enzyme comprises:

- (a) a polypeptide having the amino acid sequence set forth in SEQ ID NO:2;
- (b) a variant or homologue of the polypeptide defined in (a) having at least 50%, 60%, 70%, 75%, 80%, 85%, 90%, or 95% identity thereto and having delta-9 desaturase activity; and
- (c) a fragment of the polypeptide defined in (a) having at least about 50 contiguous amino acids identical thereto and having delta-9 desaturase activity.

6. (Withdrawn) The recombinant polypeptide of claim 1, wherein said delta-9 desaturase has the amino acid sequence set forth in SEQ ID NO:2.

7. (Withdrawn) The recombinant polypeptide of claim 1, wherein said endoplasmic reticulum membrane retention and retrieval signal has an amino acid sequence selected from the group consisting of:

- (a) KDEL (SEQ ID NO:4);
- (b) KKXX (SEQ ID NO:3), where X is any amino acid;
- (c) HDEF (SEQ ID NO:6);
- (d) KEEL (SEQ ID NO:7); and
- (e) KDQL (SEQ ID NO:8)

8. (Withdrawn) The recombinant polypeptide of claim 7, wherein said endoplasmic reticulum membrane retention and retrieval signal has the amino acid sequence KKSS (SEQ ID NO:5).

9. (Withdrawn) The recombinant polypeptide of claim 5, wherein said endoplasmic reticulum membrane retention and retrieval signal has an amino acid sequence selected from the group consisting of:

- (a) KDEL (SEQ ID NO:4);
- (b) KKXX (SEQ ID NO:3), where X is any amino acid;
- (c) HDEF (SEQ ID NO:6);
- (d) KEEL (SEQ ID NO:7); and
- (e) KDQL (SEQ ID NO:8).

10. (Withdrawn) The recombinant polypeptide of claim 9, wherein said endoplasmic reticulum membrane retention and retrieval signal has the amino acid sequence KKSS (SEQ ID NO:5).

11. (Currently Amended) A nucleic acid molecule comprising a first nucleotide sequence encoding a recombinant polypeptide comprising a delta-9 desaturase enzyme from Anasystis Anacystis nidulans in operable linkage with a second nucleotide sequence linked to a 3' end of the first nucleotide sequence, the second nucleotide sequence

encoding an endoplasmic reticulum membrane retention and retrieval signal sequence set forth in SEQ ID NO:3 or SEQ ID NO:5.

12. (Currently Amended) A nucleic acid molecule comprising the first nucleotide sequence encoding the ~~recombinant polypeptide defined delta-9 desaturase enzyme from *Anacystis nidulans*~~ in claim 11, wherein the polypeptide first nucleotide sequence comprises the amino acid sequence set forth in SEQ ID NO:2.

13. (Previously Presented) A vector comprising the nucleic acid molecule of claim 11 in operable linkage with a promoter.

14. (Original) A host cell transformed with the vector of claim 13.

15. (Original) The host cell of claim 14 that is derived from an oil seed plant.

16. (Original) The host cell of claim 15, wherein said oil seed plant is selected from the group consisting of canola, soybean, corn, peanut, sunflower, olive, palm, coconut, safflower, cottonseed, mustard, sesame, hemp, castor, avocado and flax.

17. (Original) The host cell of claim 15, wherein said oil seed plant is canola.

18-25. (cancelled)

26. (Currently Amended) A transgenic plant comprising a transgenic element ~~necontaining~~ containing the nucleic acid molecule of claim 11 in operable linkage with a promoter which effects expression of the recombinant polypeptide in said transgenic plant.

27-31. (cancelled)

32. (Previously Presented) A method for producing seed oil having a reduced saturated fatty acid content as compared to seed oil from a wild-type plant of the same species, the method comprising extracting oil from a transgenic plant of claim 26.

Appl. No. 10/583,301  
Amdt. dated April 20, 2011  
Reply to Office Action of December 22, 2010

PATENT

33-36. (cancelled)